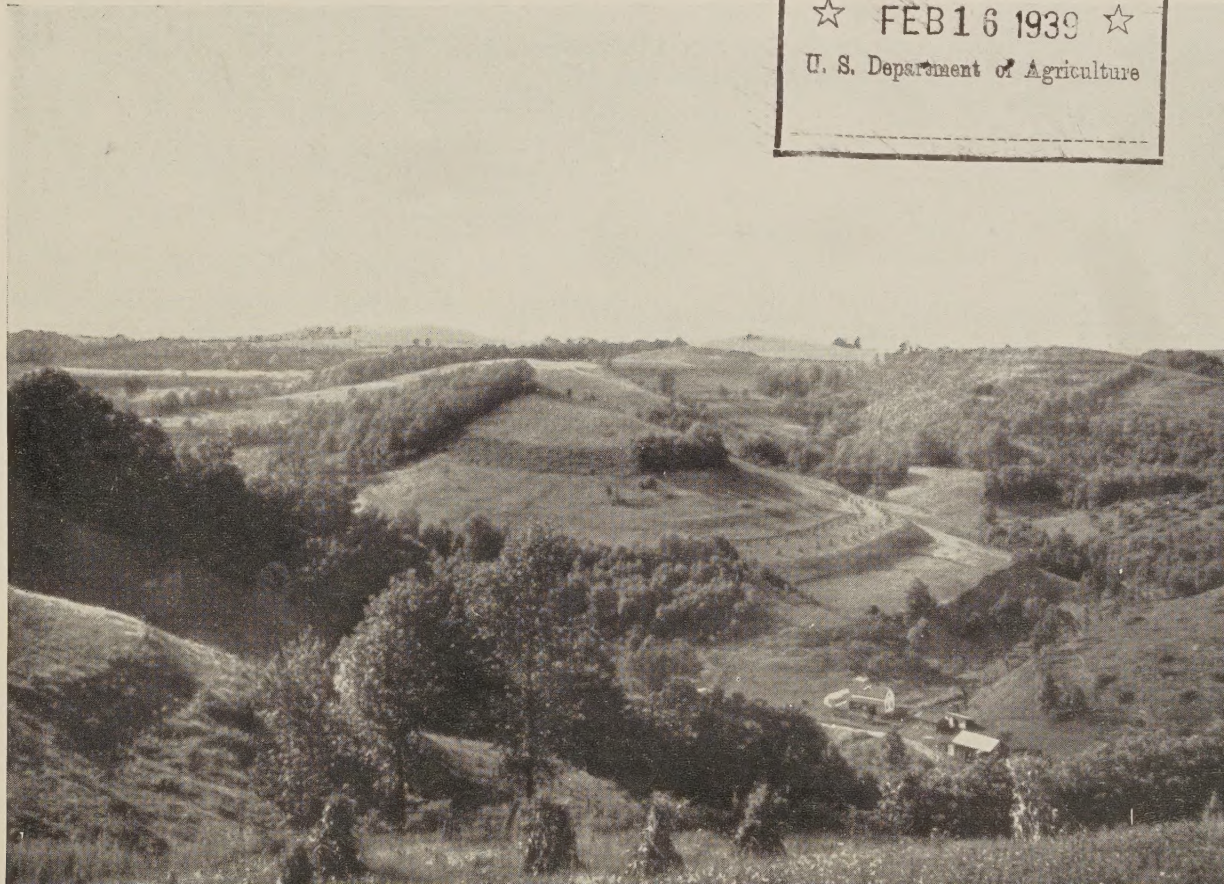
UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

EROSION CONTROL in the NORTHEAST



This pamphlet was prepared to furnish a general picture of the soil conservation problem in the northeastern section of the United States. More detailed information on the subject of soil erosion and its control may be obtained from various publications issued by the Department of Agriculture.

Washington, D. C.

Issued October 1937
Revised October 1938

U. S. GOVERNMENT PRINTING OFFICE 8—10998

FROM the fertile fields in the potato country of northern Maine to the livestock and dairy lands on the rolling hills of West Virginia, many farmers are developing a new idea of land use. In the Northeast, a section that includes most of the oldest agricultural land in the country, people interested in the business of farming are beginning to give serious attention to the action of wind and water on the soil of woodland, pasture, and cultivated fields.

Topsoil is not made in a day. It is the result of natural processes measured in periods of centuries. Slowly these processes lay down a living layer of productive material over the barren mass of rock, clay, and sand. Until the early colonists set foot on the shores of the Northeast, a dense growth of mighty forests covered this precious organic layer. With the coming of the white man the forests were gradually stripped away to provide the food and shelter which the young Nation needed for life and growth. Rapid soil erosion dates from the cutting and burning of the virgin forests.

If rain is to be the farmer's friend and not his scourge he must follow certain principles of good land use. In the Northeast, soil and water conservation is not a problem of reclamation; rather, the problem is one of husbanding present resources. With proper tillage and cultural practices the soil of this region can remain productive for centuries to come; without them, it may decline to the point of uselessness in the course of a few decades.

EROSION

WATER running downhill is no respecter of land or property rights. It scours soil away impartially from deforested mountain slope and cultivated field. Cut-over timberlands offer water a smooth runway, allowing it to pick up the speed necessary for wholesale soil removal from unprotected croplands lying below.

AN ACRE OF LAND planted continuously to corn on an 8-percent slope has been known to lose 61 tons of soil a year.

The speed of water as it flows down a slope increases with each foot of progress unless it meets with an obstacle or is absorbed by the soil. When the velocity of water increases, its soil-carrying power is multiplied many times. All sloping lands are subject to this force when they are left bare and unprotected.

DEPLETION

RACING along the furrows plowed up and down a slope, water cuts deep into the hillside, removing topsoil and plant food.

Throughout the Northeast topsoil is only inches deep. In this thin layer is contained most of the plant food that helps grow trees, grass, and crops.

EVEN ON GENTLE SLOPES as much plant food is removed by sheet erosion as by crops. On steep slopes erosion removes much more.

Without plant food no crops can grow. Pastures and fields too poor to grow grass or crops have lost their economic value.

The tillage of subsoil is "bankrupt farming on bankrupt land." Erosion robs all who feel its touch, damaging the whole community as well as the individual farmer.

SILTING

CROPS grow thinner at the top of the slope when silt washes down and chokes the fields below. Subsoil washed down from depleted upland farms does not help the lowland farmer. When upland topsoil is gone, the farms in the valley receive stones and gravel as the water's contribution.

IN LANCASTER COUNTY, PA., engineers found a small mill dam that had backed up 27,000 tons of silt in the span of an ordinary lifetime.

Soil in the creek grows no corn. But silt that started out as farm topsoil clogs streams and fills dams and reservoirs. When this happens, heavy rains or spring freshets quickly force the stream out of bounds and damage farms, towns, roads, and bridges along its course.

FLOODS

DISAPPEARANCE of vegetation means the removal of Nature's countless dams which act to slow the raindrop in its journey toward the sea. There is also a vast difference in the absorptive capacity of completely denuded soils and those which are covered by heavy forests. As the cover or protection of any piece of land departs from the forested state and approaches the point of

THE ANNUAL LOSSES due to soil erosion in the watershed of the Mississippi River are 20 times greater than the flood losses caused by the river and its tributaries.

denudation, in a like degree does the land lose its power to halt the flow of water.

Where the raindrop finds no absorptive soil, where natural dams are few and far between, where gullies form inviting channels, heavy rains run swiftly off the land to tax the channels of streams and rivers. Sometimes the rivers go over their banks to submerge adjacent farms and towns, damaging homes and property.

RUIN

WHEN topsoil leaves the farm, agriculture ceases to be a profitable occupation. In many cases, the cause of farm abandonment can be traced to neglect of simple rules of land use. Ruined farms pay no taxes, provide no food, support no families. They are a blight to the community as well as to the individual. Only age-long natural processes can restore a ruined farm to its former productive state.

CONSERVATION

Nearly any farmer can use his land profitably without permanently sacrificing its ability to produce. Careful land use involves both vegetative and mechanical methods of soil and moisture conservation. Trees and grasses are used wherever needed. Croplands frequently require simple structures of various kinds. A complete soil- and moisture-conservation program for the whole farm requires a combination of many different methods of erosion control.

TREES

ON STEEP slopes the soil needs the protection which only a healthy growth of trees can give. As the first line of defense, the canopy of their leaves shields the ground against the beating of the hardest summer rains. On the forest floor, the thick covering of litter protects the surface soil and keeps it absorptive. Beneath the ground a tangled network of

TESTS SHOW THAT it would require more than 375,000 years to lose 7 inches of topsoil on a 10-percent slope covered by virgin forest.

roots loosens the soil and keeps it porous.

Properly managed, woodlands are also a source of farm income. Protection from grazing not only guards the soil, but also permits the continuous growth of young trees to replace the crop of mature timber removed for farm use or for sale. Desirable forms of wildlife abound where food and cover are plentiful.

CROPS

CROPLANDS present special problems in erosion control. By plowing across the slope around the contours of the field, the farmer creates a series of dams lying across the path of the escaping rain water. Strips of close-growing, erosion-resisting crops, like hay, planted above and below cultivated strips, also act to check the flow of water over long slopes and guard against soil losses. Contour strip cropping, as this practice is called, offers a convenient means of crop rotation.

IN 5 MONTHS, sloping ground near Ithaca, N. Y., planted to potatoes running uphill and downhill, lost 650 times as much soil and 14 times as much water as adjoining ground planted to potatoes, oats, and clover in strips across the slope.

Terraces and strip cropping are often used together to protect a field. Terraces are broad-based cropland dams stretching across the slope. They are designed to carry away water from heavy rains and lead it slowly to a safe outlet. Farmers cultivate terraces just like they do the rest of the field. Crops benefit from the moisture saved and fertilizer losses from washing are cut down. Where terracing and strip cropping are used together, each crop row runs nearly parallel to the terrace.

STRUCTURES

GULLIES are formed where rain water concentrates and cuts deep into the soil. Eventually gully channels become impassable barriers to the progress of farm machinery and pour large volumes of water onto the fields below. A dam, or diversion structure, placed at the head of a gully will prevent it from eating farther back into valuable cropland. Inexpensive dams built across the bed will reduce the cutting power of the water and give grass and

WHEN 1 INCH OF RAIN FALLS, each acre of land has to handle 27,000 gallons of water.

trees a chance to gain a permanent foothold.

On cultivated slopes also, mechanical measures are helpful in bringing the forces of erosion under control. Generally used in combination with contour tillage, diversion ditches and diversion terraces divide large drainage areas into smaller ones. Water is carried away slowly to a protected outlet before it has a chance to gather destructive speed and volume.

WILDLIFE

CONSERVATION farming furnishes more food and cover for wildlife. Farmers, sportsmen, and people in general share the benefits that result from an abundant supply of birds and game animals.

On the back cover of this publication is a map showing the location of the projects and camps in the Northeast where practical measures of erosion control are being demonstrated on individual farms. Several States in this section of the country have enacted legislation enabling farmers to organize to carry on local conservation programs and to get assistance from State and Federal agencies.

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S.C.S. DEMONSTRATION PROJECTS
REGION I
Presque Isle, Maine
Burlington, Vt.
Rockville, Conn.
Bath, N.Y.
Ithaca, N.Y.
Norwich, N.Y.
New Brunswick, N.J.
Moorestown, N.J.
Freehold, N.J.
Waynesboro, Pa.
Vandergrift, Pa.
Lancaster, Pa.
Kutztown, Pa.
Indiana, Pa.
Newark, Del.
Ellicott City, Md.
Hagerstown, Md.
Moundsville, W. Va.
Spencer, W. Va.
CANADA
MAINE
VERMONT
NEW HAMPSHIRE
LAKE ONTARIO
NEW YORK
MASSACHUSETTS
CONNECTICUT
R.I.
LAKE ERIE
PENNSYLVANIA
NEW JERSEY
OHIO
MARYLAND
D.C.
DELAWARE
WEST VIRGINIA
KY.
VIRGINIA
NORTH CAROLINA
ATLANTIC OCEAN
LEGEND
S.C.S. PROJECTS
S C.S CAMPS